Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

FRIDAY, MAY 30, 1862.

◆

CONVERSAZIONI.

The second and third Conversazioni of the present season will be held at the South Kensington Museum, on the 9th of July and the 8th of October.

INTERNATIONAL EXHIBITION OF 1862.

SEASON TICKETS.

Members of the Society and others are informed that Season Tickets may be obtained at the Society's house, on application to Mr. S. T. Davenport, the financial officer. Price three guineas and five guineas, the latter also admitting to the Horticultural Gardens and *fetes* during the season.

GUARANTEE.

The Council beg to announce that the Guarantee Deed is still lying at the Society's House for signature, and they will be much obliged if those gentlemen who have given in their names as Guarantors, as well as others interested in the Exhibition, will make it convenient to call there and attach their signatures to the Document. Signatures for sums amounting in the aggregate to £451,800, have been attached to the Deed.

TWENTY-SECOND ORDINARY MEETING.

Thursday, May 29th, 1862.

The Twenty-second Ordinary Meeting of the One Hundred and Eighth Session was held on Thursday, the 29th inst., the Right Hon. the Earl Granville, K.G., Vice-President of the Society, in the chair.

The following candidates were proposed for election as members of the Society:—

Churchill, Lord Alfred S., M.P.	16, Rutland-gate, S.W., and Athenæum, S.W.
Kennedy, John	Whitehaven.
McConnel, James	Bent-hill, Prestwich, near Manchester.
Robinson, Francis	48, Conduit-street, Hanover-square, W.
Scott, James	St. John's Grammar School, Hamilton, N.B.
Scovell, George	34, Grosvenor-place, W.
Sutton, Edwin	204, Regent-street, W.

The following candidates were balloted for and duly elected members of the Society:—

Chapman, David Ward	Totness-park, Sunningdale, Berks.
Clabon, John Moxon	21, Great George-street, S.W.
Cowper, Samuel T.	Leeds Iron Works.
De Vandoni, Gen. Count.	45, Manchester-street, Manchester-square, W.
Dobson, J. T.	Hull.
Fleming, George	22, St. James's-street, S.W.
Fox, Thomas	Lordship-lane, Tottenham, N., and 93, Bishopsgate-st., E.C.
Gardener, Chas. Henry	West Harding-street, Fetter-lane, E.C.
Hall, Collinson	Navestock Hall, Essex.
Hall, Ralph	Manchester.
Hannay, John	Springfield, Ulverston.
Knight, J. G.	47, Pembroke-square, Kensington, W.
Low, Sampson, sen.	47, Ludgate-hill, E.C.
Marshall, J., M.D.	Queen's-rd., Up. Norwood, S.
Maule, George	1, Kennington-road, S.
Neilson, Walter	172, WestGeorge-st., Glasgow.
Overend, James	47, Parliament-street, S.W.
Pearson, Z. C.	34, Great St. Helen's, E.C., and Hull.
Rodoconachi, M. E.	3, Gloucester-square, Hyde-park, W.
Ryley, Edward Chas.	16, Gt. Prescot-street, Goodman's-fields, E.
Sharman, Edward Alfred.	2, Heathcote-street, Mecklenburgh-square, W.C.
Shaw, George	9, King Edward-street, E.C.
Siebe, Daniel	17, Mason-street, Lambeth, S.
Spence, Joseph	22, St. James's-street, S.W.
Summerscales, John	Keighley, Yorks.
Taylor, George	Clarence Iron Works, Leeds.
Traer, J. R., F.R.C.S.	47, Hans-place, Sloane-street, S.W.
Ward, Reginald	20, Albion-road, St. John's-wood, N.W.
Weston, Joseph D.	Stanhope-villa, White Ladies'-road, Clifton, Bristol.
Wickens, H.	112, Camden-rd.-villas, N.W., & 4, Tokenhouse-yard, E.C.
Young, William Joseph	Roker, Sunderland.

And as Honorary Corresponding Member.

Kaznadar, The General Mustapha	First Minister and Minister for Foreign Affairs to the Bey of Tunis.

The Paper read was—

ON THE INTERNATIONAL EXHIBITION OF 1862.

By William Hawes.

It is just twelve months since I had the honour, at the request of my colleagues, of reading a paper upon the then contemplated Exhibition, the object of which was to show that there were good grounds for anticipating that an International Exhibition in 1862 would be as interesting, as instructive, and as beneficial to the country as that of 1851. I arrived at this conclusion from the evidence I collected of the progress which had been made since 1851 in every department of science, art, and manufactures, and from the support and encouragement the intended Exhibition would receive from the lively interest it was well known Her Majesty and the Prince Consort took in everything which could aid in its complete development.

In every respect but one these expectations have been fulfilled; manufacturers, at home and abroad, have fully realized—indeed, exceeded—all that could have been expected; and the exhibition, as a whole, far surpasses that of 1851. But in one sad respect—one over which human forethought and care could have no influence—they have been most lamentably disappointed. The Prince to whom the nation owes so much, to whom this Society is indebted for the proud position it holds, and to whose sagacity and wise appreciation of the wants of his adopted country we owe the conception of the means to carry out successfully an idea which originated abroad, but which this country, under his direction, realized and perfected—is no longer among us. Our Society, in all its proceedings relating to the Exhibition, was specially encouraged and directed by his advice and example. In the papers read at our meetings, in those printed for general circulation, in all communications with our members and the public, whilst shewing, by a careful examination of the facts obtained from all sorts of exhibitions, that there was every reason to feel confident that a properly conducted International Exhibition in 1862 would be a great success, we never failed to express the reliance we placed upon the active support it would receive from the constant supervision of our late Royal President. And although we have every reason to believe that Her Majesty's interest in its success is as intense as ever, it has unfortunately been deprived, by the death of the Prince Consort, of that support, which the constant visits of the Royal family would have afforded; as well as of the intelligent counsel, the sound judgment, the varied and extensive knowledge, and the encouragement of his personal presence, which would have crowned the whole with an *eclat* and national popularity that must have placed this Exhibition in the estimation of the world, as its merits really deserve it should be, far above those which have preceded it. Too much importance cannot be attached to this untimely loss.

I will not, this evening, stop to criticise the building, either architecturally or constructively, nor the arrangements of the Commissioners. The loss they sustained in the death of the Prince Consort, whilst greatly increasing their difficulties, stimulated them, I have no doubt, to greater exertions; and I believe, when all the conditions under which the plan of the building was determined upon are fairly considered, and become generally known, as no doubt they will be when the report of the Commissioners to Her Majesty is published, we shall find that as much has been done, and done well, as could possibly be expected in the management of an undertaking so various, so complicated, and so novel; but whether this be so or not, even if the building be as inartistic as some assert it to be, the faults, as well as the language in which they have been described, will speedily be forgotten, while the great intrinsic merit of the Exhibition—the good feeling it will promote between manufacturers of all nations, must leave an indelible mark in the history of every country participating in it—recording an industrial progress in ten years, greater in some countries than in others, but in all far beyond anything that has ever before been known in a similar or even in a much longer period—thus giving a fresh impetus and renewed vigour to the industry of the world.

But it is said in derision by some that the International Exhibition is but a great shop. A great shop indeed it may be, but if it be a shop it is one to which all the world is proud to contribute its rarest, and its best, as well as its cheapest and most useful works, its highest art, its application of that art and taste to common things, to the luxuries for the rich, and to the necessaries for the poor, each improved by extended competition and by the new ideas artists and manufacturers derive from the examination on one spot of articles produced in all parts of the world; thus securing the best and cheapest article for the consumer, showing producer and consumer where they can buy and sell to the greatest advantage, results which could not be attained, beneficial as they are to all, if those who incur the great risk and expense of supplying such various and costly manufactures were prohibited from their sale. Can it, then, be otherwise than an honour to any country to devote itself to the periodical opening of a shop—if it please any one so to call it—or International Exhibition, in which all civilised nations are competitors, by which the people from all countries are instructed, and feelings of amity and friendship between all nations are cultivated?

I will now proceed to inquire

1st. Whether the International Exhibition of 1862 has realised the expectations of its promoters?

2nd. Are we making the best use of it—nationally, commercially, and socially?

3rd. Is the period of ten years the best for the recurrence of such gatherings?

4th. Do such Exhibitions stimulate the industry of the world, encourage art, and tend to hasten, in the words of our late Royal President, "the accomplishment of that "great end to which all history points—the realisation of "the unity of mankind—not a unity which breaks down "the limits and levels the peculiar characteristics of the "different nations of the earth, but rather a level the result "and product of these very national varieties and antagonistic qualities?"

If we can answer these inquiries satisfactorily; if we can show that since the first International Exhibition our designs are more simple—our colours purer and our workmanship better; and that the effect of progress is visible in the increase of our trade all over the world, then the object of the Royal Commissioners, of our Society, of the guarantors, and of the exhibitors, has been abundantly realised.

We shall all admit that the most ready mode of estimating the success of public undertakings is to be found by the examination of the opinions expressed upon them in the daily press. We may not agree in the details of its praise or censure, but we must allow that it rarely fails to reflect, with tolerable accuracy, public opinion in its general and most decided outlines. I need not then occupy your time by more than a general reference to the all but unanimous praise by public writers, not in this country only, but in foreign countries, of the magnificence of the articles exhibited, of their superiority over those of 1851 and 1855, and of the absence of inferior commodities, which filled a large space in the Crystal Palace of 1851.

The censure of the press has been confined to criticisms on the building and on the management—the constructive skill and the wonderful rapidity of execution are universally acknowledged. To these censures, without at all admitting their justness, indeed, believing them in the main to be erroneous, we may say that when all circumstances are considered, the immense labour discharged voluntarily by the few upon whom the responsibility of the management has devolved; when prejudice, personal disappointments, and professional jealousies are allowed for; and when we remember the impossibility of the writers of the articles we refer to being fully acquainted with the reasons of the Royal Commissioners for adopting one plan or one course of management in preference to another, it would indeed be wonderful if they were free from as much censure as has been passed upon them. Of this they may, however, be confident, that the country is deeply indebted to them for the energy and skill they have displayed.

All the critics, English and foreign, admit the skilful adaptation of the interior of the building to the purpose for which it has been designed. Many, English and foreign, are loud in their praise of the novel effect produced by the two domes; all acknowledge the admirable construction and perfect lighting of the picture galleries; and all admit that whether tested by the number of exhibitors, English, foreign, and colonial, or by the value and excellence of the articles exhibited, the present Exhibition is vastly in advance of 1851; and I believe I am correct in saying, that not a single critic has ventured to assert that the display, in any important branch of industry, is inferior to that made in the same class in 1851. We will refer, then, to a few of these classes, as well as to the new industries which were unknown in 1851.

First, as to FINE ART.—With the exception of sculpture to a very limited extent, Fine Art was not represented in 1851. Paintings in oil and water colours—frescoes, drawings, and engravings were not then admitted. The 1,400 English oil paintings, the 1,000 pictures from foreign countries—the 600 water colour paintings of the very highest quality and interest—the sculpture distributed over the building, placed where it can be best seen, and where it will most contribute to the general effect, will so distinguish this Exhition from 1851, as, all other things being equal, to give it a present interest and permanent reputation far beyond its predecessor; and when the large proportion of the entire building allotted to English and foreign fine art is considered, it entirely removes from this great gathering of the world's art and industry, the foolish stigma which some have attempted to impress upon it—viz., that it has no other purpose or object than that of a commercial speculation.

It may be, and no doubt is, true that exhibitors expect to gain commercially by their contributions, but the gain to the nation is to be measured by other results than the profit of individuals. The greatest success nationally might entail a loss to exhibitors. A profitable result to them is, however, the best evidence of the novelty, beauty, and utility of the articles exhibited, and of the success, nationally speaking, of the Exhibition.

Without a reasonable probability of its being a commercial success to the exhibitors, could the public enjoy the inspection of such a wonderful display of the world's industry?—a display which nothing but the commercial greatness of the countries contributing to it could have brought together; and which affords the strongest evidence of the increasing power, wealth, and enterprise of the industrious classes of the world.

For the first idea of an International Exhibition, and for everything relating to the early history and progress of Exhibitions, their success, the evidence of the stimulus they afford to industry, we are indebted to that country which carries artistic feeling and design most thoroughly into every branch of its manufactures; and in 1855 France so far extended the example we set in 1851, as to admit works of fine art by native and foreign artists, thus filling up the void we had left, and supplying what was indispensable to the illustration of the progress of art in a country which from the earliest period had considered an artistic education as essential to its manufacturing success.

To ignore then this wonderful collection of pictures, drawings, engravings, and sculpture, freely contributed from private or public collections, English and foreign, and exhibited in the same building with the finest specimens of our art industries, from all parts of the world, and so placed as to facilitate comparison and examination, and thus to stimulate the cultivation of the taste for beauty in design and workmanship, and to call this a commercial speculation, shows a want of sympathy with the principle and object of this great World's Fair unworthy of any journal assuming authority to direct the public mind.

I shall not notice the respective merits of particular schools, masters, or pictures, or compare those of one country with those of another. I believe the collection fairly represents the schools of England, Belgium, Norway, and Denmark, though not so fully those of France, Italy, and Russia. We have never before had an opportunity of examining and comparing with our own school a large collection of the works of modern foreign artists of every country in Europe. As Englishmen, we have reason to be proud of the great artists we now only know by their works, Hogarth, Reynolds, Gainsborough, Old Crome, Turner, Calcott, Wilkie, Newton, Constable, and Leslie, as well as of those who are still among us, and who continue to delight us each succeeding year by their new and beautiful creations; and I am sure that they, more perhaps than any other visitors, will acknowledge the value of the instruction they will receive from being able to compare not only the productions of foreign artists, as works of art, with their own, but also their mode of manipulation.

Chromo-lithography must be mentioned here, for, although not strictly a fine art, it is certainly fine art to the million. But little understood in 1851, it now conveys beauty of design and composition to the minds and homes of those to whom nothing but the commonest coloured prints were before accessible. The Austrian and Zollverein pictures are particularly beautiful and cheap.

The collections of raw materials and other products from our Colonies and from India next require notice. The number of exhibitors in 1851 was 520, from 19 colonies; it is now about 2,000 from 31 colonies; and the articles exhibited are of far greater interest and value, as compared with 1851, than is indicated by the number of exhibitors. It is impossible to particularise the gorgeous specimens of manufacture from India, or the specimens of raw produce brought from each colony—they are various, rich, and interesting, and give unmistakeable evidence of the vast supplies we may in a few years expect to receive from them; gold, copper, lead, and coal; wool, cotton, coffee, corn, timber, sugar, and every possible variety of tropical oils, seeds, gums, resins, and fibrous plants are here to be found, of the finest quality and of infinite variety, only wanting capital, labour, machinery, and time to bring them in almost unlimited quantities to supply the growing demands, and in many cases the decreasing supply, of the old world.

Then, as regards new industries, or those which, from the change that has taken place in the mode of manufacture, have become almost new industries; first, we will call attention to Photography, that new branch of fine art still in its infancy, but employing many thousand persons, and which is most admirably represented by English and foreign artists. It is not for me to say which country exhibits the finest specimens. French, Austrian, and English artists have all produced pictures showing great taste and most skilful manipulation. So great has been the progress in every branch of this art since 1851, that we may fairly expect, with the aid of chemical science, to see still greater advances in the next ten years. The apparatus and appliances exhibited for working in and out of doors are of much interest. One striking fact conveys a clearer view of the value of this art as an industry than any description. M. Voigtlander, a manufacturer of the most expensive lenses only, has just celebrated with his workmen the completion of his 10,000th lens; this gives some idea of the immense demand for apparatus of this character that has been created in the last few years.

CHEMICAL PRODUCTS (Class 2).—Here, among a great variety of beautiful preparations, we can record several new discoveries since 1851, from which most important industries have already arisen.

The new dyes—the specimens of which, both French and English, are remarkable for the scientific knowledge displayed in their discovery and for the skill shown in their preparation, are of great national importance, from the changes they are making in the art and practice of dyeing and printing and in the trade in dyes—introducing an easy and simple process for one requiring great chemical knowledge and most skilful manipulation, and substituting for an import trade of costly dyes and dye-stuffs, an export trade of valuable dyes produced from a residuum (coal tar) which till recently was almost a waste substance.

Sea-weed, hitherto all but a waste product, has recently attracted the attention of the scientific chemist, mainly from a prize offered for the best essay upon it by one of our distinguished members. Iodine, various new and important saline combinations, useful in dyeing, and pulp for paper, are among the new applications of this vegetable product of the ocean.

IMPLEMENTS OF WAR AND NAVAL ARCHITECTURE (Classes 11 and 12) formed classes in 1851, but the rifled cannon of Armstrong and Whitworth, the Whitworth and Enfield rifles, and the iron-plated ship, had no place there. Nothing can be better arranged to show every step in the construction of these new and powerful implements of war than the collections from Woolwich, from the Whitworth Company at Manchester, from the London Armoury Company, the Mersey Steel and Iron Works, and the beautiful models from the Admiralty. Foreigners appear to confine their exhibitions in these classes to a few specimens of breach-loading and sporting guns, pistols, &c., of beautiful workmanship.

Agricultural Implements (Class 9), although very fully exhibited in 1851, may, from the successful application of steam power to so many new operations, be considered, in one of their most important branches, as a new industry. The American exhibitors claim attention in this department, though their exhibition is very small.

Philosophical Instruments (Classes 13, 14, 15).—The increase in these classes is very striking. The rapid progress of scientific discovery at home and abroad since 1851 has increased the demand for and stimulated the invention of new instruments, as well as directed attention to excellence of workmanship. The great variety of apparatus required for photography, and for the beautiful and ingenious inventions of Mr. Wheatstone and others in domestic and general telegraphy, the instruments for spectrum analysis, to illustrate the discoveries of Bunsen and Kirschoff—binocular microscopes—the new and educational museum microscope of Smith and Beck, with its three powers and 500 objects, are among the great variety of new and improved philosophical instruments and appliances invented since 1851, forming together a new and most important branch of industry, and employing a very large number of workmen from the highest class to those of more ordinary skill. I believe that in the number, quality, variety, novelty, and accuracy of workmanship, of the instruments exhibited in these classes, all constructed to enlarge the sphere of observation and to ensure the greatest accuracy in the pursuit of the various branches of science, we are surpassed by none, even if we are equalled by the long celebrated workmen of Paris.

The Educational Class (29) had no place in 1851, and shows the attention now being paid by all countries to the means by which the greatest amount of the most useful instruction may be conveyed to the pupil in the shortest time, and the models of school-houses and rooms, with the means of ventilation, show that attention is, but not a day too soon, being paid to physical as well as to mental education. All the great educational societies have assisted in making this collection. France, Prussia, Switzerland, and Norway have each contributed their educational appliances, and the comparison of them with our own cannot fail to be useful, and the practical mode of teaching adopted at the Agricultural School at Beauvais, as well as the simple but eminently useful models exhibited by foreign countries, deserve attention. The increase in the number of schools and scholars, and the consequent increased demand for maps, models, diagrams, and cheap apparatus for illustrating science, has raised this interesting class into a new branch of industry. I must here mention the exhibition, for the first time, of a drinking fountain—one of the indirect, but not less valuable, means introduced since 1851 to improve the physical, and therefore the educational, condition of the people.

Paper (Class 28) may be noticed here, on account of the new and rapidly extending application of vegetable fibres in lieu of rags; and from the quantity of paper now made either entirely or partially from them, it deserves to be classed among new industries developed since 1851. England, Belgium, and the Zollverein appear to be equally alive to the importance of this branch of manufacture. The necessity for providing a new material for paper is best illustrated by the fact that, in 1851, Messrs. Applegarth exhibited their last improvements in printing machinery by which 10,000 copies of the *Times* were printed per hour. Now we have American machines printing 20,000 per hour, and there are several of them at work on our daily press, thus doubling in ten years our power to supply the increased demand for information, involving, of course, a corresponding demand for paper. India, our Colonies, and Algeria have sent specimens of vegetable fibres, which appear to be adapted, as regards price, quality, and quantity, for paper materials. It may be interesting to mention that the Austrian catalogue is printed on paper made from maize fibres, mixed with cotton and linen rags; the French catalogue on paper made from maize and cotton rags.

I must now briefly notice those Classes in which old industries are exhibited, and point out a few of the most striking improvements since 1851.

Mining, Quarrying, Metallurgy, &c. (Class I.), are much more fully represented than in 1851. In the English department there is an almost perfect representation of the mineral wealth of the United Kingdom, and our colonies have sent collections most carefully selected and most admirably catalogued, which show the enormous mineral wealth in these appendages of the British Empire, and which some would dissever from the Imperial Crown because the protection of our commerce with them, now so thoroughly in its infancy, appears to cost a few millions per annum. Owing to these collections being divided, those of Great Britain being arranged in connection with the industries to which they belong, and each colony having its own, they do not produce the same effect as the magnificent series of mineral earths and rocks exhibited by the Zollverein and Belgium. The new industries belonging to this class since 1851 are those arising out of the discovery and application of aluminium and its alloys to the useful arts, the substitution of clays for iron in gas and other retorts, and the discovery in America and Canada of petroleum or earth oil, which appears likely to produce almost as great a revolution in the oil trade as when gas was first introduced.

Substances used for Food and Animal and Vegetable Substances for Manufactures (Classes 3 and 4).—Although it has been said that the collection of raw materials from the vegetable kingdom in this Exhibition is not, as a whole, so perfect as in 1851, still, in many respects, it is superior to it. First in importance are the cereal products of the finest quality from our colonies generally—but our Australian colonies in particular have astonished the agricultural world by their wheat and maize. The wheats from these colonies weigh up to 70 lbs. per bushel—a weight rarely attained elsewhere. The collection of woods has never before been approached; we have it in planks, in sections of the tree at different ages, with and without the bark, in every possible variety for furniture and cabinet work, and also specimens of ornamental furniture made from these woods in the colonies. Here then we have food and timber of the finest qualities and in great abundance, waiting for the capital and industry of the mother country to bring it here for our use, creating new industries of the most important and enduring kind. The collections in these classes from France and other colonies appear to be very perfect indeed, and are most beautifully arranged.

Machinery (Classes 5, 6, 7, 8).—The most striking feature in these classes is the superior character of the machinery exhibited—its size and power—its workmanship. There is not much novelty, but each machine is very superior in every respect to that in the same class in 1851. In 1851 but one marine engine was exhibited to work the screw propeller. Now there is only one applied to paddles, and that is Swiss. The steam hammer is shown in every form of single and double action, English and foreign; only one was exhibited in 1851. The improvements in the manufacture of steel are strikingly illustrated by Mr. Bessemer and Mr. Krupp. Sewing machines, which were hardly in use in 1851, are now exhibited in various forms for application to different trades and classes of work. There is a great increase in foreign machinery exhibited, but every observer must be struck with the superiority of English workmanship. The models of engineering works executed at home and abroad by the most distinguished engineers of the day since 1851 will be viewed with great interest.

MEDIÆVAL WORKS, in Class 10, require special notice. It is possible that an ordinary observer, in passing through this class, may think there is a want of novelty in the forms and character of the articles exhibited, and that the effect produced upon his mind is not so startling as it was in 1851. But he forgets how much the study of the arts and industry of the middle ages of the period of rennaissance has advanced, and how familiar the intervening period has rendered him with the examples in the best style which are collected and exhibited in the Kensington and British museums. Upon close inspection, he will find that, in material value, quantity, historical importance, and in design, the collection of 1862 far surpasses that of 1851, and that, for the purposes of the art student, it will be much more useful than its predecessor.

SURGICAL INSTRUMENTS (CLASS 17).—Great improvements have taken place in this very important class since 1851. We still maintain our superiority for quality, but in novelty of adaptation we are surpassed by other countries. Denmark appears to excel in some new adaptations; Italy and France have each produced most interesting improvements; but in quality, Russia, Italy, and Denmark appear to be inferior only to England, and all in this respect are, I believe, superior to France.

TEXTILE FABRICS—COTTON, WOOL, SILK, FLAX, AND HEMP (Classes 18 to 24.)—These classes, from their immense importance to the industries of the world, will attract, as in 1851, great attention from English and foreign manufacturers. The English manufacturers, I believe, show a marked advance in design and taste, the practical result no doubt of the facilities for artistic education afforded to a large number of young persons during the last 10 or 15 years, through the exertions of the Department of Science and Art. This has, I am informed, excited the special attention of foreigners. The improvement in colour from the discovery of new dyes to which I have already referred, and in texture and quality, from the modifications made from time to time in machinery will, I believe, be appreciated.

But the improvement is most striking in our woollen and worsted fabrics, though, starting from a higher point in 1851, it is not perhaps quite so marked as the progress of Austria, which has made wonderful strides in this manufacture. Russia also shows much progress in printing and dyeing, but Saxony, the birth-place of the woollen trade, is far from strong.

In silk (Class 20) I believe we have every reason to be satisfied with our position, being inferior only to our great competitor in one respect, the artistic treatment of colour in design. In quality of colour and of fabric I am informed there is little to be desired. There are, however, two specimens of brocaded silk from Lyons (No. 1,871 in the Catalogue), superior, I am informed, to anything ever before produced from the loom. They are equally remarkable for taste in design—beauty of colour, and skill in workmanship.

In cotton (Class 18) I fear we are not quite so fully represented as in 1851. The names of many of our largest manufacturers in Manchester and Glasgow do not appear as exhibitors. Enough however is I hope exhibited to show the progress of design, the brilliancy of our new colours, and the accuracy of our printing, and thus to maintain our position as the first manufacturers in the world.

FURNITURE AND DECORATION (Class 30).—The furniture exhibited by our best makers, either in wood or metal, can, I think, safely challenge competition with any foreign work. As an example, I would refer to the oak sideboard in the nave. Here again we mark improved design and execution, which, beginning in the highest class, gradually descends and improves that which is made for the use and ornament of the more humble habitations. Carving, applied to furniture—imitation of valuable woods by the painter and japanner—the general adoption of a purer and more simple taste in colour and design, whether in furniture made of the most costly or the cheapest materials, all give a special character to the goods exhibited. Processes for ornamentation which are now common in England, had scarcely one example in 1851. The display of Austrian and Prussian furniture of certain descriptions will attract great attention from its beauty and cheapness, and excite our workmen to fresh exertion. Bronzes, objets d'art, &c., which appear to be almost monopolised by France, are of great beauty, and among them are very interesting new works in copper and lead for architectural purposes.

HARDWARE, STEEL, AND CUTLERY (Classes 30 and 31).—We have scarcely a competitor in these classes; and it is the beauty of the workmanship, rather than any novelty or new invention, which will attract attention. And this observation will apply to the smallest as well as to the most ponderous articles included in these classes.

GLASS, CHINA, EARTHENWARE AND POTTERY (Classes 34 and 35.)—It is difficult to say in which of these industries the advance has been the greatest. On the whole it appears most visible in glass, which is of the finest quality and ornamented with designs, the execution of which has never been surpassed. Indeed it is only in the last few years, since the repeal of the excise duty, that any substantial progress could be made in this beautiful manufacture.

In plate and other ornamental glass our superiority is not so clear. France, Belgium, and Austria, have each contributed beautiful specimens, which cannot fail to be admired.

China must be divided into ornamental, and useful. In purely ornamental it is much to say that we can challenge competition with Sèvres and Dresden, but in useful china, of high quality, in porcelain and earthenware, we are superior to all in quality, design, colour, and price.

There is some very good common china and earthenware from Italy, and some very cheap from Hungary, but these are copies, in form and design, the Italian mostly from English patterns, and the Hungarian from those of Japan and China; there is no national character about them.

In pottery we are also in advance of all.

The improved forms and cheapness of our rough ware are universally admitted, and our encaustic tiles and terracotta are deserving of great attention.

Our chemical apparatus is admirable in manufacture and variety, whilst the increased use of glazed drain pipes in the last few years, has almost created a new and valuable industry.

Such, then, is the brief and imperfect summary of the contents of this Exhibition which the time allotted to these papers enables me to give, but which, I hope, is enough to illustrate the views of those who have taken an active part in bringing this vast collection together.

In every department progress since 1851 is manifested in a degree unexpected by the most sanguine. Our trade has in the same time increased more rapidly than in any similar period in the history of the empire. How far this is to be attributed to the stimulus the Exhibitions of 1851 and 1855 gave to the industry of the world each must form his own opinion; the old jealousy of allowing rivals, especially foreigners, to see what each was doing has passed away, and every intelligent manufacturer now relies upon a reputation gained by the most universal appreciation of his skill. But for International Exhibitions we should not possess a vast amount of useful information, gathered from all countries, of great value to art and industry. It is by comparing each Exhibition with its predecessor that we are able to ascertain, to record, and to profit by the progress of every country in each 10 years; and this interchange of useful information enables all to appreciate the advantages belonging to the pursuit of each industry where it can best be conducted, and must lead to economy of production, to the advantage of labour, to the extension of commerce, and to improved commercial relations between manufacturers and producers in all parts of the world.

We have next to consider whether we are making the best use of the great advantages this wonderful collection of human industry places within our reach.

I think it cannot be disputed that the highest object of an International Exhibition is the collection and dissemination of the most accurate information concerning the arts, manufactures, and commerce, of all countries, thus illustrating the political, social, and commercial condition of their people. Another purpose is the collection of specimens of the mineral, animal, and vegetable productions, or of raw materials, from all parts of the world; but this is of secondary importance, as they can always be procured in the ordinary course of business by those interested in any particular branch of trade. But our workmen cannot obtain the information they require by any other means than those afforded by International Exhibitions. A workman may occasionally see a specimen of foreign handicraft, but he has no particulars on which he feels he can rely of its cost or the mode of its production. It may be a specimen only shewn to him to depreciate the value of his labour, and by reason of this uncertainty, it is sure to excite his jealousy and prejudice against foreign workmen. He cannot know the real position it holds in the country where it has been made, or whether it fairly represents its available mechanical skill. This information he can only acquire by the examination of foreign labour in various stages and forms of manufacture, and where can he obtain such knowledge but at an International Exhibition? To him the comparison of manufactures from all countries, and of many different specimens from each, is invaluable. No Mechanics Institution can give him such useful knowledge, no teaching in the Department of Science and Art can give him such instruction, as he will derive from a few hours spent in inspecting the work, in its various forms, of his foreign rivals. To the intelligent and skilful workman an International Exhibition is an industrial college, teaching in the most practical manner—educating the eye, the hand, and the taste—stimulating industry and ingenuity—removing prejudices, and, by enlarging the sphere of observation and giving new ideas, making better workmen.

The importance of this inspection is very strongly felt in France, not only, as I shall subsequently shew, by the numbers admitted to the Exhibition in 1855, but by the arrangements now being made for the careful examination of every branch of industry at this Exhibition by working men. Independently of clubs to bring over numbers of working men cheaply, there is a special sum appropriated by the Imperial commission to pay the fares of deputies to be elected from the great body of each trade by their fellow-workmen.

Feeling, then, as strongly as I do the invaluable effect which the inspection of this Exhibition must produce on working men, I am led to ask if it can produce results of the same national importance on the upper classes. I think it cannot; nor is it necessary that it should. No doubt it will elevate the estimation of the manufacturer in the minds of many it amuses; surprise and excite wonder by the intrinsic beauty and exquisite workmanship of the articles exhibited, and by the wealth of which it gives such striking evidence; flatter the national vanity to see England's superiority in so many branches of industry; but where, among these classes, can it afford industrial instruction, or stimulate industry, or produce any permanent result calculated to maintain the supremacy of England's manufactures?

But when we turn to the middle and industrious classes we find, besides the pride they feel, in common with all, in the collection of the world's industry, a high appreciation of the great benefits they must derive from the practical instruction they receive at these International Exhibitions. They prove their sincerity by providing the security on which the money is raised for the erection of the building—they supply it when erected with the wonderful collection it contains, and then, by their anxiety to inspect the works of all countries, of their rivals at home and abroad, find a large portion of the funds by which the expenses of management are to be paid.

In 1851,	Season Tickets, and 20s. and 5s. admissions, produced	£67,514
	The 2s. 6d. admissions	72,447
	And the 1s. „	221,271
In 1855,	the 5fr. admissions produced	£6,735
	2fr. „ „	7,663
	1fr. „ „	83,904
	4 sous „ „	17,459

So that the working classes of Paris, at 4 sous each, paid more than the 5fr. and 2fr. admissions together, and besides being visited by more than 2,000,000 of people paying but 4 sous each, the Exhibition was open free on one Sunday before it closed, when a vast number were admitted who would not otherwise have seen it. The numbers then admitted were enormous, but no account was taken of them.

I have drawn this comparison because I conceive it to be true and just, and necessary to illustrate the view I take of the proper mode of making the utmost use of these most valuable of modern institutions. Their object is undoubtedly to disseminate information among the great mass of master manufacturers and men in all countries, to improve their taste and stimulate their industry. Any arrangement which excludes the great body of those for whose benefit such institutions were inaugurated, is inconsistent with the broad principles of universality upon which they are based; such exclusion is in antagonism to the publicity which is demanded now-a-days in every sphere of action. It checks the operation of the principles of free trade, for what is the use of free trade by law, if, when we have the opportunity of teaching our workmen how to compete with their foreign rivals, we refuse to allow them to take advantage of it. Unless this is done, a demand is created for foreign works and our own producers are prevented from learning how to compete with them. You thereby injure the workman, the dealer, and the merchant.

How, then, do I apply these observations to the present time? I say we open the Exhibition too many days in proportion to the rich, and too few to the workmen. We do not give to our workmen the advantages given to the French workmen. I believe in the low tariff to produce good pecuniary results. The penny postage stamp produces more than the eight-penny or shilling letter. I have greater faith in the realisation of a large sum by a low tariff than by a high one. I would not open the Exhibition every day at the lowest rate; but whilst, in the interest of science and of instruction, and I may say of fashion, I would have one day weekly at a comparatively high rate of admission, and other days at one shilling for the general bulk of the visitors, I would devote certain days weekly to still lower rates, and as exclusively as possible to working men. Let them feel that an International Exhibition has a truly national object—that they are to derive benefit from it, and then they will learn to appreciate more thoroughly the sacrifice of time, the labour, mental and bodily, which have been required to bring such collections of industry together, and they will retire from the examination of these triumphs of skill and manufacturing industry better satisfied to contribute towards and to aid the exertions which are being made to improve general education, and to enter more fully into the importance and the utility of the large votes for educational and artistic purposes which every year pass the legislature.

In the presence of our chairman, I am almost afraid to state all I feel on this part of my subject; but I am sure he will forgive me when I say, that I fear that the Commissioners are not, as a body, sufficiently reliant on the great principles of political economy, which assure us that the safest and best principles of government are those which give the greatest happiness and instruction to the greatest number. Look at the large sums we are now annually spending in education, in teaching the principles of science and art. Ought we, then, to neglect an opportunity like this, which can only recur at comparatively long intervals, of advancing the education we have begun, and of showing the practical effect of knowledge and industry and how to obtain excellence and the rewards which belong to it. If it can be shown that by the proposed arrangements for admission we do give to our intelligent and educated workmen all the advantages this wonderful exhibition of the world's industry is calculated to afford them, and at the same time secure the largest receipts, my argument falls to the ground; but looking to the examples before us—especially that afforded by the French Exhibition of 1855—it appears to me impossible to arrive at that conclusion.

The question of prizes comes naturally under this division of my subject. The arrangements for this year are an improvement upon 1851, as there is only one description of medal to be given, and that for excellence only; so that many may be given in the same class, and much injustice thereby avoided. The balance of opinion appears so strongly in favour of prizes, that we must hope the jurors will distribute them so freely as to secure this acknowledgment to every one whose articles exhibited give evidence of special merit, whether of invention, workmanship, materials, taste, cheapness, or general applicability to the object in view.

The next question is, what is the right period for the recurrence of such exhibitions? I think I may assume all will agree that their too frequent recurrence would, in fact, render them almost useless for the great purpose they are intended to accomplish—viz., that of marking clearly at intervals the progress of the world's industry. Looking, however, at the decided progress in the past ten years, I think we may safely assume that to be a proper interval between exhibitions. It affords time for new inventions—for working out practically the new ideas of the previous exhibition; and the increase of population, and the change which annually takes place in it, produces so large a number of new exhibitors and visitors as to ensure popularity and support. If then we could confine International Exhibitions to England it would not be difficult to determine the period which should intervene between them, or even were they to be limited to England and France. But such is the value set upon them by other nations, which have contributed very largely to the Exhibitions of 1851, 1855, and 1862, that it is impossible, in considering this question, to confine our view to those two countries.

There are 31 foreign countries contributing to the Exhibition. There are about 18,000 foreign exhibitors. France supplies between 5,000 and 6,000, the Zollverein above 2,000, Italy 2,700, Austria 4,000, Spain 1,100, Portugal 1,000. Great Britain was represented by just under 1,600, and her colonies by about 1,000; or together, 2,600 exhibitors in Paris in 1855. These being the facts, it appears reasonable that whenever France, the Zollverein, Italy, Austria, Spain, or Portugal desire to hold an International Exhibition, and are prepared to supply proper accommodation for it, so long as we expect them to contribute a full and valuable collection of their art and industry to our Exhibitions, we must be prepared to do the same to them.

We have, then, to consider how this difficulty is to be met, for should a decennial period be considered as that most desirable for England and France, that is, an Exhibition in either country, each five years, what should be the period, if Exhibitions are also held in other countries from which as many, or nearly as many contributors have come to us and to Paris as we sent to France, or should we refuse co-operation with them if they desire it?

Before we can decide this question we must inquire how far the Governments of these countries would interfere in the management of such Exhibitions, and how far each has contributed hitherto and would contribute, were they to be held more frequently, to the expenses incurred by exhibitors in sending their goods to foreign countries.

At present we have three instances from which to draw conclusions. England in 1851; New York in 1853; France in 1855. The Exhibition in 1851 was, as we all know, begun by our Society, acting under the advice and direction of our late Royal President, by whom it was soon expanded into an International work. The entire expenditure, paid by the money received from the admissions, amounted to £320,000, and there was a large surplus besides.

That in 1853, at New York, was a private speculation, and was an entire failure. All we can clearly deduce from this failure is that something more than a pure mercantile speculation is required to ensure success to an International Exhibition. That in 1855, in Paris, was a great success in every respect but in a pecuniary point of view to the Government.

The cost of the building was little short of £500,000, and that of the management about the same, both being defrayed by the Government, less the amount of the receipts for admission, which were but £128,000. The experience gained by the Exhibition of 1851, no doubt induced the French Government to incur this great expense for a permanent building for the greater part of the collection, instead of imitating our light and almost fairy structure. The determination to make the main portion of the building permanent and substantial, led to the large expenditure as compared with ours in 1851, and justifies that incurred by our Royal Commissioners on the buildings for 1862.

The English Government appropriated £50,000 to the expenses of conveying the goods of English exhibitors to a French port, and for the cost of the superintendence in Paris. This sum was placed under the control of a committee presided over by Mr. Cole, and the amount expended, everything included, was only just above £40,000, £10,000 less than the estimate, a saving caused mainly I believe, by the French Government taking charge of everything at the port of entry and defraying all the expenses of the carriage to Paris.

The French Government in 1851 and this year have paid every expense connected with the transport and exhibition of the goods sent here for exhibition, and the amount so paid in 1851 was about 1,200,000frs., or £48,000, and I am informed that this sum will not be exceeded this year.

I am unable to state with accuracy the expenses incurred by other nations, but I have reason to believe it is small compared with that spent by England and France; but the principle of each Government bearing the expenses of transit and of exhibition appears to be adopted by all. Unless, then, we are prepared to follow this example in every instance, as we did in 1855, our art and manufactures will either be unrepresented, or will appear under very unequal conditions. We may fairly assume that at a cost of from £40,000 to £50,000, we can secure a proper representation of English art and industry at any continental Exhibition; but if we be inclined to bear this cost, can we expect that owners of valuable works of art, and the manufacturers of large and expensive machinery, will exhibit the one or the other except on special occasions and at distant intervals? I fear not.

The determination, then, of the proper interval for the recurrence of International Exhibitions is full of difficulty; and the only plan I can suggest for the collection of information upon which we can arrive at some satisfactory determination is for our Society, at an early period, to open communications with the proper authorities, in countries likely to desire to hold International Exhibitions, in order to arrange that they shall not be too frequent, or at cities too distant from the coast, to interfere one with the other, or to preclude the support they require for success. Of this we must feel assured, that, in future, they will not be supported unless, from the experience we shall acquire before this Exhibition is closed, the world at large is satisfied that such gatherings are universally beneficial. To inaugurate a new Institution required the countenance, support, and personal position of our late Royal President; but such aid would fail in inducing people, from all parts of the world, to incur the serious expense and anxiety of sending goods thousands of miles, if they could see no prospect of benefit arising therefrom; and certainly the support of those who take the foremost place in promoting all works they believe likely to produce great national and international results, and who are willing to contribute to the general collection, works of art of great value, which the public can never see and enjoy but by some such means, and without which an exhibition would lose a great portion of its attraction and utility, cannot be again obtained unless the results of this Exhibition show clearly that, since 1851, industry has been stimulated, art improved, public taste purified, and the general intercourse between nations promoted.

It has been no trifling difficulty to satisfy the public, in 1862, recollecting the Exhibition of 1851, and at the expiration of another ten years that difficulty will not be lessened. I am sanguine, however, that all minor difficulties will be forgotten when, in October next, we can, by the aid of the reports of the jurors, clearly indicate what influence the Exhibition of 1851 has had in urging forward the marvellous progress which their reports will record in the past eleven years, and that, satisfied with such results, we shall look forward to still more brilliant success in future, and feel grateful to those who have undertaken and carried to a successful issue the Exhibition of 1862.

We will now proceed to inquire whether the Exhibitions of 1851, 1855, and 1862 have produced the good results anticipated from them, whether they have stimulated industry, and whether they have promoted good-will among the great nations of the world. Many will reply at once, and consider it a perfect answer to the inquiry, that there has been more war since 1851 than there was in the 20 or 30 preceding years. This may be quite true, and yet it may not be difficult to prove that, notwithstanding the Russian and Italian wars, both hotly contested, but more speedily terminated than any previous wars begun on a similar scale, the improved tone of feeling among the nations of Europe and between their governments, and which enabled us to hold the first International Exhibition in 1851, has been still further and more rapidly improved since that time by the influence of the French Exhibition of 1855. The very great increase in the number of foreigners who visited England in 1851 beyond those of any previous year, and the annual increase since that time, is of itself evidence of great value. The correspondence, however, between the two countries affords the most certain evidence of increased intercourse. In 1851, the year of the Exhibition, the number of letters was 2,495,375. This number increased steadily, at about the rate of 4 per cent. per annum till 1860. In 1861 the increase was nearly 25 per cent., and the total number of letters which passed between England and France was 5,438,225, an increase of nearly 120 per cent. in ten years. But, besides this, we have the acts of foreign governments, which prove that in their opinion increased facilities of intercourse with England have been and are mutually beneficial. Independent of the evidence afforded by the commercial treaty with France, we have the great fact of the abolition of passports for Englishmen by several of the most important governments in Europe, a boon of great value not only for the commercial facilities it affords, but for the confidence it exhibits in the English character. But whilst international communication is facilitated between certain European countries and trade increased, what evidence have we that the industry of the world has been stimulated, and that we as a nation have derived benefit from these Exhibitions? In a period so short as ten years it is not so difficult to mark progress as to trace that progress to its right source. We must, then, be content to say that, coincident with our adoption of those liberal feelings which prompted the first design of an International Exhibition, and their acceptance by foreign countries, we have a steady and most decided increase of trade and intercourse between the various countries of Europe and the world. We see the distrust which was unmistakeably shown abroad in our fair and honest intentions when the invitations for co-operation were first issued in 1851, replaced by the most entire confidence in 1862, and the number of foreign exhibitors nearly doubled. We have benefited from the unrestricted comparison of the industries of both countries in the exhibitions of 1851 and 1855. Each saw that it possessed advantages in the production of certain articles of commerce and of general use; and, using the knowledge so obtained, we have, by abolishing prohibitory duties, promoted those industries for which each country is best adapted, and thereby bound our commercial interests more closely and firmly together.

Here, then, is the evidence of the general benefit derived from these accumulations of the world's industry under one roof, and open to the inspection of all—here is the evidence of the confidence this universal contribution of industry of all kinds, from all nations, inspires, increasing good-will among people who, till lately, had little accurate knowledge of each other, and still less of the actual state of their respective industries. Besides, the all but universal interchange of postal facilities, and the adoption of our system of stamps, by which postal arrangements between the various countries of Europe are much facilitated, are strong evidences of a mutual desire to encourage intercourse. No one will pretend that these changes are to be attributed entirely to the effect produced by two International Exhibitions, but they prove that the confidence each nation has in the other has been gradually strengthening and increasing, rendering restrictions on intercourse needless, to the great benefit of all.

Surely then, we are not wrong in assuming that the improvement which has taken place in the fiscal regulations between France and England was much promoted by the information obtained at the Exhibitions of 1851 and 1855. They caused an immense increase in our commercial intercourse—they taught us each other's industrial power—and with the specimens of our own industry and of those of foreign countries now before us we can safely say, that whilst in no former similar period has there ever been such progress as in the eleven years just passed—progress, especially, in the improved and cheaper production of everything which enters into the every-day life of the people of every nation participating in these exhibitions,—England, perhaps more than any other, has derived great advantages from them. No one who remembers the articles exhibited in 1851, in earthenware, hardware, glass, furniture, and all the innumerable comforts and necessaries of life, can doubt this beneficial movement.

If I am correct in these conclusions, and in this statement of the facts on which I base them, there can be no doubt that International Exhibitions do promote the industry of the world, have thereby been productive of general good, and must be beneficial to us, as well as to every nation contributing to them; and I trust, again quoting the words of his late Royal Highness, "that now "the products of all quarters of the globe are placed at our "disposal, we have only to choose which is the best and "cheapest for our purpose, and the powers of production are "entrusted to the stimulus of competition and capital."

International Exhibitions cannot benefit any one nation exclusively. We must be satisfied that there is room for the success of all, and that the country which displays the most energy, skill, and judgment will, in the end, derive the greatest benefit from them.

Thus I have endeavoured, feebly I fear, to record what has been accomplished during the past eleven years, as shown by the Exhibition now before us. But it is impossible to conclude this review of the progress of industry since 1851, without recollecting that during this period, in which so much has been done—in which so much talent, science, and industry have been devoted to the art, manufactures, and commerce of the world, there have been two European wars begun and ended; we have quelled a mutiny on a most gigantic scale, threatening our largest, richest, and most important possessions in the East; there has been a war with China; wars with the aborigines in our colonies—some begun and finished—but one still raging; our trade with America, by its internal dissensions, has been almost destroyed, and our most important industry at home thereby paralyzed.

Every important State in Europe, as well as the great Republic across the Atlantic, has been getting year by year deeper into debt, to the extent, in the aggregate, of £500,000,000, spending this immense sum either to coerce their subjects, or to check the progress of independence, or out of pure rivalry and jealousy of one another's power, thereby crippling the industrial resources of mankind. If, while industry has been so heavily taxed, and the labour of so many thousands withdrawn from it, it has advanced more rapidly than was ever known before in a like period, have we not a fair right to attribute a portion of this movement, and not a small one—to the effect produced commercially, industrially, and socially by the two International Exhibitions already held, and the anticipation of and preparation for that now before us? And if such results have been realised during the past ten years, what may we not expect if it please Providence to allow nations to learn wisdom by experience? wisdom to avert war by the study of the records of death, disease, and crippled industry which follow in its train; wisdom by the study of the arts of peace, and the happiness and contentment, the political and social order it produces; and wisdom to study the results, equally clearly marked by every step taken in the direction of free trade, of removing shackles from industry, and of reliance upon the loyalty of a contented and industrious people—then, indeed, we may expect greater results in the next ten years than those, great as they undoubtedly are, of the past decennial period. Greater or even equal waste of industrial resources in a similar period by the governments of the world it is hardly possible to conceive. It is, then, a proud position for this Society, having originated International Exhibitions, to be able to point to the Exhibition of 1862 as fully justifying a course of action persistently pursued for many years; and I trust the Council will continue to be guided by the principles it has hitherto adopted, remembering, in all it undertakes, the wisdom and prudence, yet promptness and liberality which distinguished our late illustrious President, and then I fear not that an increasingly useful and honourable career is yet before it, and that at some future but not too distant period, the Society will again become the promoters of another International Exhibition.

DISCUSSION.

Mr. **Marsh Nelson** said it struck him, while listening to the account so ably given them of the mode of classification adopted in the Exhibition, that on any future occasion they should arrange the articles in a different manner. If a classification had been adopted with regard to manufactures and arts, instead of by countries, it would have been more convenient. Take, for example, the article of glass. It was difficult for a person to travel from the British exhibition of glass manufactures to that of Austria, and carry in his eye the different qualities; but if all the glass productions had been arranged together—French, Austrian, and Hungarian—they might easily compare them and judge which was the best. This mode of arrangement was adopted with regard to pictures, and he did not see why it should not be for shawls, laces, and other manufactures. They had all been placed in one gallery, and it was possible to compare one picture with another. But with respect to every other description of art or manufacture, they had to travel from one part of the building to another in order to institute any comparison. In the case of the present Exhibition he noticed, the other day, that in the central nave there was one of Peters's four-horse drags side by side with a toy stall; and on the opposite side a display of Worcestershire china was followed by a model of the North Foreland lighthouse. He thought if all the drags had been put together, and all the china and all the toys together, it would have been a more useful arrangement than that which had been adopted on the present occasion; and in any future Exhibition, whether in this country or in France, he hoped this plan would be carried out—and that a building would be erected so that each part might be suited to the particular class of objects to be exhibited. Skilful manufacturers were in the habit of erecting warehouses suited to the particular quality of manufactures they had to exhibit. He had been recently much struck, in going through a large private building erected for the display of silks. A particular kind of light was given for their advantageous display, and special colours on the walls. With regard to the arrangement of the pictures, it appeared to him that it would be a great improvement in any future Exhibition if they were arranged chronologically. By that means the artist would be able to see the progress which had been made. The next point which he thought they might discuss with advantage, was the building itself. The gentleman who had given them this able comparative account, had rather slurred over that part of the subject; and, whilst he had spoken of the present Exhibition as being superior in almost all respects to those of 1851 and 1855, the only matter on which he expressed any doubt was with regard to the building. He (Mr. Nelson) would point out a few instances in which he thought errors had been committed in the present building, not with a view of cavilling, or of throwing blame upon anybody, but in order that they might guard against those faults in future. He had taken a sketch of the building, as given in one of the numerous guide books, and, supposing they entered from the Exhibition-road, there was no protection in the way of a vestibule, or any place where a body of people could be marshalled previous to entering the Exhibition. They came, in the first instance, to one of those enormous domes where the glare of light was excessive, and all after that appeared dull and melancholy in comparison. The great secret of all art in such matters was to keep back the effects they wished to produce till the last moment, rather than to thrust them all at once upon the eye of the observer. On entering, instead of making an ascent, they descended several steps on either side to get to any part of the building; that was not only inconvenient but detracted from its dignity and imposing aspect. They then walked along till they came to what was designated the central transept, when a feeling came over them of the lop-sidedness of the building. What was the cause of that? It was because on the left hand side they looked up and saw a glass roof with abundance of airiness and light, whilst on the other side there was an exceedingly ugly brick wall. The result was lightness on one side and extreme heaviness on the other. The next point was, that on leaving the French courts, the effect on entering the nave was most depressing, because they had not the same amount of light as they had at the sides; but then it might be said that decoration came to the aid of the architect, because, although they did not see the sky, they had the nearest approach to it in the grey colouring and cheerful decoration of the ribs, rendering them as much like Tunbridge ware as could be conceived. He did not think that was exactly the style of decoration suited for a great national building like this, and that it had better be avoided on future occasions. Upon the plan the central part of the building was called the "central transept." Now, when he paid his first visit he looked for the so-called central transept, and walked from the dome at one end to that at the other end, and he confessed he was not able to discover which was the central transept, till a friend suggested to him where it was, and then he saw nothing but a statue of Moses facing one of Garibaldi. Walking to the Cromwell-road entrance, he found again, instead of a vestibule, there was another red brick wall adorned with carpets, whence, turning right and left, an entrance was gained to the picture gallery. A more unartistic arrangement he had never seen. They then ascended to the picture gallery, which in extent, height, and dimensions, was all that could be desired; but it appeared to him that a large gallery was not the proper place for the exhibition of pictures of all classes. The noble lord in the chair had travelled a great deal, and many present had no doubt done the same; but there was one thing which must have struck everyone with regard to the picture galleries abroad, namely that instead of having one large continuous gallery, there were a number of small rooms in which the cabinet pictures were exhibited. However good the large gallery might be for the exhibition of gallery pictures, the cabinet works were lost in it. From this gallery they passed into the smaller galleries appropriated to the water colour pictures. He would say no more of them than to characterise them as unseemly railway sheds, only to be compared to their neighbours, the Brompton Boilers. Passing through these galleries, and proceeding to the western dome, they saw what a mistake it was to make these domes a part of an Exhibition building of that kind. As far as exhibiting objects was concerned, they were unsuitable, because it became positively necessary to shut out a great portion of the light from the domes by awnings. Everything about the domes was wrong, and, taken altogether, he regarded them as most inartistic structures. Then he would call attention to the want of design in the terminus of the vista of each transept. At the end of the transept they found a large opening, leading into the carriage department, which must strike everybody as closely resembling a catacomb, and more suited for the exhibition of hearses than carriages. That portion of the building had evidently been sacrificed for the sake of the gallery over it. In another Exhibition he hoped that would be avoided, as it showed that a two story building was not appropriate for such purposes, because in the lower floors everything was sacrificed to the floors above them. On the occasion of a paper being read, at an early period of the session on the Exhibition of 1862, they were told that they should reserve their opinion of the building until it was opened. They had done so, and not only that, but they had waited to hear the opinions of people from every country in Europe, and he had no hesitation in saying this building was a national disgrace. Let them not imagine for one moment he intended to say anything against the gentleman—able, no doubt, in his own profession—who designed this building. On the contrary, he considered him an ill-used man. He believed he was not anxious to have this work put upon him. The Royal Commissioners were told, as plainly as words could be spoken, that Capt. Fowke was not the right man in the right place, but, notwithstanding that, notwithstanding what they must have seen when they went to survey the ground, notwithstanding the contiguous building, the Brompton Boilers, was know to have been the design of the same gentleman—[Mr. H. Cole, "No, no"]—they still persisted in adopting his design for the building. With regard to Mr. Cole's contradiction, he (Mr. Nelson) would say that common report erred, inasmuch as the design of the South Kensington Museum was attributed to Capt. Fowke. He had no doubt it would be argued that, as this was only a temporary building, it was unfair to judge of a man's architectural abilities by such a structure, but he would call to their mind that a detailed plan and description of proposed alterations of the National Gallery were published in the *Cornhill Magazine*. This was a design by Capt. Fowke for a permanent building, intended for a national picture gallery. Now he (Mr. Nelson) contended that with that design before them the Royal Commissioners showed great indiscretion in employing a man who could propose such a plan as that. No doubt Capt. Fowke had done his best, but he (Mr. Nelson) found fault with those who employed him, and who thrust upon him a work which he was unable properly to perform, and which, he contended, had brought down a national disgrace upon the country.

Mr. Gerstenberg (Commissioner for Ecuador) said the gentleman who had just addressed them had shown that criticism was easier than the practice of art. He had spoken with a fluency which showed that he had well studied the subject; but though the paper read was upon the International Exhibition of 1862, the last speaker had only very lightly touched upon that subject. His remarks had been principally addressed to a criticism of the building, which was only a part, and in his (Mr. Gerstenberg's) opinion not the most important part, of the Exhibition. As one of the foreign Commissioners he would bear his testimony that the present building, for all practical purposes of an exhibition, was superior to that of 1851 and to that of Paris in 1855, and possessed many advantages which those buildings did not enjoy. One great merit in the present building, he considered, was, that the entrance was immediate. They had not to pass through long vestibules, as suggested by Mr. Nelson, and in this respect he thought it was an improvement upon some of the public buildings on the Continent. Mr. Nelson had omitted to state one objection which had been generally taken by foreigners with regard to the building itself—that was, that it had no central point; that the duality occasioned by the two domes detracted from the unity of the building; and that there was an absence of the grand effect produced by the central transept in the building of 1851. He, in common with other foreign friends, entertained no doubt, if the present experience had been possessed when the structure was erected, a great many faults which had been mentioned would not have been committed; and undoubtedly they would be avoided in future—but he must say, with respect to the merciless remark that the building was a national disgrace, that if any future building were entrusted to any one individual—even if he were Mr. Nelson himself—he would not be able to satisfy all parties. He would say one word with regard to the great importance and usefulness of such Exhibitions, as shown by the readiness with which everybody was now prepared to offer an invitation to others to witness the secrets of his trade and manufacture, throwing them open to the inspection of the world at large. He recollected some years ago that the manufacture of machinery was carried on under the greatest secresy, and the trade was kept as a profound mystery; but at the present moment they saw that false doctrine exploded. The consequence of the former system was that nobody was able to learn anything of his neighbour, and the development of machinery was very slow, but at the present time there were mechanical inventions from all parts of the world open to the inspection of every one, and this was a matter of the greatest utility. With regard to articles of raw produce, there was a great question at the present time as to the supply of cotton in England and silk in France. The people of the latter country were apprehensive that they might be visited with a similar commercial calamity with regard to silk which England had experienced with regard to cotton, and they were now endeavouring to introduce the cultivation of silk into every country where it was possible. The world had been rather surprised that the people of Manchester had not taken the steps which seemed so necessary with regard to cotton; but he believed the present Exhibition would lead to great practical results in that direction, because there were samples of cotton from various parts of the world where hitherto it had been only scantily produced, and scarcely any of it imported into England; this must open the eyes of the British public, if it did not succeed in awakening the people of Manchester to the fact, that it was not their duty to allow the working population of Lancashire to be pauperised, but to try to procure the raw material, which would make them prosperous labourers. He would only add, that the foreign commissioners were in nearly all respects satisfied with what they had seen of the Exhibition, and with the courteous and cordial hospitality which had been extended to them.

Mr. G. A. Sala, as one of the public, might be allowed to say a few words on an essentially public question. With regard to the contents of the Exhibition he had viewed them with satisfaction, wonder, and admiration, but with respect to the building he might, as one who had given some attention to art, say a few words. Mr. Nelson had characterised the building as a national disgrace; he (Mr. Sala) did not consider it a national disgrace but a national mistake, and for this reason: It would be in their recollection that in 1851, all eminent men as architects and designers were called upon to send in plans for the Great Exhibition, and they all recollected what hideous, monstrous, and abnormal designs were sent in on that occasion, and he remembered how his eyes were horrified by some of these designs. Those designs were mediocre, common-place, every-day things, but it occurred to Sir Joseph Paxton, by what he would term an inspiration of genius, to send in the design of the Crystal Palace of 1851. He repeated, that was an inspiration of genius, and that design threw far into the shade every other architectural plan submitted to the commissioners; but it was due to the architects of the country to state that whilst the design of Sir Joseph Paxton was a marvellous combination of iron and glass, it was common-place in its form, and, as originally conceived, presented a resemblance to three packing cases piled one upon the other, until the late Sir Charles Barry added the transept, and that addition made it the beautiful thing it was. As regarded the Exhibition building of 1862, he considered that various errors had been committed. The building was certainly not magnificent; indeed, in his opinion, it might almost be called hideous. The picture galleries certainly were light, commodious, and spacious; and albeit he agreed with Mr. Nelson that there was a want of smaller adjacent apartments in which the cabinet gems could be displayed with advantage, instead of being lost amongst the mass of larger pictures, he must say the picture galleries of the Exhibition were amongst the grandest and most satisfactory features of that otherwise most unsatisfactory building. But in this the error was committed. They did not expect perfection in the building, but they did expect a building which should equal if it did not surpass that of Sir Joseph Paxton. But did they go to work the right way to get a building which should either rival or equal the former one? Were the most eminent architects of the day consulted as to the builing? As one of the public he was taken by surprise—not at the announcement that another Exhibition building was wanted—but that Captain Fowke had been appointed to construct it. If ever there was a deed done in a corner, it seemed to him to be that which was done by the Royal Commissioners, or by some one, he did not know who, some mysterious body, some conclave sitting in an underground building, meeting together, wrapped in robes of mystery, who said, "Fowke, and Fowke only, is the man." But he might be allowed, whilst decidedly expressing, as he believed, the opinion of a not wholly uninfluential section of the public, that the present building was an infringement of all the canons of good taste, to say that he did not think Captain Fowke was so much to be blamed for what he had done. What more could he do? He was, doubtless, an able officer of the Royal Engineers; but did the Society of Arts, a hundred years ago, ask an officer of Engineers to paint the pictures in that room? If Barry had been Barry, R.E., instead of Barry, R.A., would he have been asked to paint these pictures, representing the progress of the arts and sciences? That mysterious council which he had referred to bethought themselves that a Royal Engineer officer was an artist: they were led away by sundry sketches by Captain Fowke—probably prepared at Woolwich—for turning the National Gallery inside out—and that body fixed upon him. Hence this great national mistake—not, however, a national disgrace. That might be repaired by the speedy demolition of the building after the purposes for which it was unfortunately erected had been served, or else by its conversion to some other useful commercial purpose. He would conclude these few remarks by expressing his admiration of the contents of the Exhibition. His opinion was that the contents of that Exhibition were not a national disgrace, but a national honour, and likely to conduce to the prosperity, the glory, and the honour of England.

Mr. John Dillon rose upon a point of order. On reading the title of the paper he found it to be "On the International Exhibition of 1862." By the turn which the discussion had taken the most important points of the paper had been left out of consideration, and they had lost sight of the glorious fact that they had called together under one roof all the nations of the earth in this International Exhibition. He therefore thought it would be more becoming to direct some portion of their attention to the contents of the Exhibition, rather than to devote their whole time to the criticism of the building itself.

The Chairman said, being appealed to, he felt a difficulty in deciding this question, first of all as presiding over a most interesting discussion, and on the other hand being somewhat in the position of a criminal placed on his trial. He could not agree that the able paper of Mr. Hawes precluded all discussion upon the merits or otherwise of the building; at the same time, as lovers of art and harmony, he thought they would desire that the criticisms of the building should not be out of all proportion to the subject, and that the whole time should not be occupied by this one topic; but this was a matter which he thought must be left to the discretion and good feeling of the speakers.

Sir Charles Fox begged to state that, with reference to the transept in the building of 1851, Mr. Sala was in error when he stated it was the design of the late Sir Charles Barry. The merit of the introduction of that transept was entirely due to his late respected partner, Mr. Henderson.

The Chevalier de Schwarz (Chief Commissioner for Austria) said, as one of the foreign commissioners, he begged to express his delight at the progress he had witnessed in the present Exhibition, as compared with that of 1851; he believed he expressed the very general opinion of the exhibitors when he stated that the building was in every way suited for its purpose. He did not think it very important if the building did fall short in architectural design. If they were invited into distinguished society, they did not regard the house to which they were invited, but the persons they met there. This was his feeling in the present instance. He hoped that it would be accepted as the general opinion of the foreign exhibitors with regard to the Exhibition building, that it answered in every way the purposes for which it was designed.

Mr. P. L. Simmonds regretted that on each occasion of a paper having been read upon the International Exhibition, it should have been made the battle-ground with regard to the building. To return to the subject of the contents of the building, which was more important to those who had sent their contributions, he would only speak for a few moments of that portion over which he had had a considerable amount of superintendence—the colonial department; and he was sure any one who looked upon the progress of those dependencies contrasted with the former occasion, could not but be struck with the immense advances that had been made, not only in manufactures and commerce, but in some of the arts. In 1851 there were but few colonies which took part in the Exhibition. On the present occasion more colonies had taken part than foreign countries; and it was highly creditable to this country that its dependencies had come forward in such a way to show to the world the progress they had made in their manufactures and in the discovery of those raw materials and other products which were so important to us as a nation. There was another feature, which might be pointed to as satisfactory with regard to our colonies, that was the sums of money which each had voted for the expenses of the exhibition. Many of the larger colonies had voted sums very handsome in proportion to their means, particularly the Australian Colonies. New South Wales had voted £10,000, Victoria £12,000, and the new colony of Queensland had voted between £3,000 and £4,000. Passing from the sums voted to the articles sent, he might state that they consisted principally of the raw materials in which this country was most interested, but they also showed the progress of industry in many important instances. One or two of these must have struck the most superficial observer. The great material of gold could not have escaped observation. The pyramid at one of the entrances showed the amount of gold that had been extracted from Victoria alone—representing a weight of no less than 800 tons. That was not the only auriferous colony in our possession. The gold discoveries in British America had induced a large population to go out there. In addition to the samples of gold obtained from our Australian colonies, their was an exhibition of the quartz crushing machine used in Victoria for obtaining the gold from those rocky deposits. In our North American colonies, the gold discoveries were of great importance; and in British Columbia the indirect as well as direct benefits resulting from the gold discoveries there were most remarkable. Those discoveries might have been productive of some evils in the first instance, but ultimately important benefits were conferred upon the colonies which were gold-producing. In the great staple of wool—second only to that of cotton—this country looked to its colonies for the large supply required for our home consumption; and it must have taken the manufacturers of Manchester by surprise to have found that in such a region as Australia, the most valuable qualities of cotton could be produced; and if that industry could be developed in conjunction with the wools of the sheep and alpaca, together with the valuable furniture and building woods, and—if all the metallic resources of our large colonies were made available for this country, the result could not be otherwise than most important. He thought all who had seen the colonial produce in the present Exhibition must have been struck with admiration of it.

The CHAIRMAN said, although he had the privilege of listening to a great many debates, he had seldom taken a more lively interest in any discussion than in that which had taken place that evening. There was one thing which had more particularly interested him, namely, the suggestions which had been made with regard to the present and future exhibitions; indeed, most of them could have reference only to the preparations for a future Exhibition. He had had the great honour of being intimately connected with the two great Exhibitions which had taken place in this country, and he might say that some of the happiest recollections of his life were associated with the Exhibition of 1851; and having now, under different circumstances, been connected with the management of that in 1862, he had felt the greatest interest, not wholly unmixed with annoyance and trouble, in the conduct of this Exhibition, though he did not look forward to having much connection with another Exhibition, even if he were asked to do so. As some of the suggestions made affected him personally, it might not be uninteresting to the meeting if he stated the impressions which occurred to his mind upon hearing them. First of all, he was relieved when the gentleman who had spoken so much on this subject, in expressing his disapprobation of what had been done, never mixed it with one grain of approbation upon any one single point. He believed the British public were so experienced with regard to grievances and grumblings, that when a speech took that form of unmitigated censure, it did not produce so much effect upon their ears, and still less upon their minds, as when it was qualified by a certain amount of really judicial criticism. Looking, however, to the prospect of future exhibitions, he did not think some of the suggestions made were such as he should be inclined to recommend. With regard to the taste in which the building had been designed and carried out, he would not advance his opinions on that subject in the presence of such a meeting as this, least of all, in the presence of the gentleman who had addressed them with all the advantages of training as a professional architect, but with regard to one of his suggestions in particular, he (the Chairman) had that English feeling which was in favour of being free and easy in his actions, and he could not conceive a more disagreeable notion than the being "marshalled" with a number of other persons in the vestibule of an exhibition before entering. He did not know what might be the system of military volunteering in the days of the next Exhibition, but he would rather step in at a side entrance than submit to drilling before going in. Then with regard to architectural unity, it did not appear clear that a building composed of different sections, each designed for a different purpose, could possibly possess any architectural unity or beauty of design. Another point on which it was probable there would be greater unanimity was, as to the arrangement of the articles exhibited. For his own part, he had not the slightest doubt of the superiority of the geographical classification over any other. He believed under any other system the difficulties of the management would be increased a hundred-fold. Nothing had given him greater gratification than to witness the liberal, cordial, and conciliatory feeling which had characterised every foreigner with whom he had been brought into contact since their arrival in this country in connection with the business of the Exhibition, but he did not believe that human nature was strong enough, if Russians, Frenchmen, Germans, and Italians, were mixed up together in the building, each accustomed to do business in different ways, to enable them to go on with that harmonious feeling which had hitherto existed. He admitted that, for the jurors or for students, such a classification as Mr. Nelson had recommended would be a saving of trouble, but that was all; for he believed persons in each branch of manufacture could make the comparisons between the productions of each country just as well under the present classification as they could do by having all the articles in one class placed side by side. Although he had travelled a good deal, yet he would say there was something very interesting in finding one's self, when in the Exhibition, suddenly, as it were, in a foreign country—being surrounded by the products of that country—which would not be the case if the articles of each country were distributed in a great many different parts of the building. Mr. Sala, who had spoken very well indeed, and had given them praise and blame in equal proportions, had expressed himself at a loss to understand why the commissioners selected such a building at all; but he thought the beginning of that gentleman's speech furnished the reasons why they did so. He (the Chairman) had not forgotten the experience of 1851. He remembered that eminent men were called upon to give plans, the result of which was that none were considered satisfactory. He never should forget the feeling of pleasure with which he first saw the beautiful design of his excellent friend, Sir Joseph Paxton, which seemed to come so opportunely to relieve the difficulties of the moment, and whilst speaking on this matter, he might remark that there was sometimes great advantage arising from vicissitudes. There was a strong feeling in the public mind that the two noble elm-trees in the park should not be cut down—the British public would not hear of such a thing; and hence that which was at first regarded as an obstacle, had, as Sir Charles Fox had stated, originated the idea of a transept which should enclose the trees.

In comparing the present building with that of 1851, he believed nine people out of ten associated the latter with the beautiful erection now standing at Sydenham, but that was a very different structure, in a great many respects, to the building of 1851. As it was, however, the commissioners found a plan ready prepared. He might say that the late Prince Consort thought most decidedly that the present building was infinitely better adapted for exhibition purposes than that of 1851, and he (Lord Granville) thought it would have been folly on the part of the commissioners to have rejected that plan. He might add that the design was shown to Sir Joseph Paxton before it was finally settled upon, and he expressed his opinion that it was extremely handsome, and well adapted for the purpose. There had been some changes in the design, which had been adopted from motives of economy. That might be a misfortune, but it was a circumstance to which every one was more or less liable from a want of cash. He would now allude for a moment to the suggestions made in the paper, relative to the admission of the working classes to view the Exhibition at reduced rates of charge. He thought that was a question bearing upon the future, and, as such, was one of considerable importance and interest. It was a subject requiring great consideration. First of all they must know what numbers the shilling admission would bring to the Exhibition, because it would not realise Mr. Hawes's views of the greatest happiness to the greatest number, to stuff the largest number of persons possible within a limited space, which they could not extend; and they must remember, after all, whether the admission were a shilling, or sixpence, or twopence, the admission itself bore a very small proportion to the expense incurred by persons coming up from the country to see the Exhibition; and whilst entirely agreeing with Mr. Hawes, that the persons most likely to benefit from the Exhibition were our intelligent artisans, at the same time it would not be confering a favour upon that class to cram the building with persons inferior to them, so that they would have great difficulty in seeing the objects that were exhibited. While, as bearing upon the question of receipts, the price of admission was most important, still the whole question was one which ought to be looked upon in a large and liberal spirit, and not with mere mercenary motives; but when an enormously expensive undertaking of this sort was carried out by private enterprise, some account must, no doubt, be taken of the receipts. He agreed to the fullest extent as to the advantages to be derived from these Exhibitions—he agreed that their chief value consisted in giving the working classes the fullest possible access to them, but what would be their position if they found the receipts not amounting to one-fifth of the cost of the undertaking, as they had heard had been the case with the Exhibition in Paris? Therefore, he thought in the interests of future Exhibitions, they were bound to look to the question of receipts. With regard to the admirable paper of Mr. Hawes, he could only say he thought, quite agreeing with him as to the advisability of as many of the working classes as possible attending the Exhibition, quite agreeing with him as to the degrees of advantage to be derived by the different classes in visiting the Exhibition—he would, certainly, say for himself, and he believed many would agree with him, that he should go back and study that Exhibition with greater advantage from having heard his judicious, philosophical, and practical remarks upon it. He did not defend the faults of the Commissioners, but however they might dispute about it, the national credit was to a certain degree connected with the success or failure of this Exhibition; and without yielding to any undue bias, he might say that every opinion worth having that he had heard was, that the present Exhibition was in all respects superior to anything that had ever yet taken place in this or any other country; and it was well worthy of this Society, which from the beginning had taken so deep an interest in it, and had borne so active a part in promoting these Exhibitions—first on a small scale, until under the fostering care and influence of the Prince Consort, they had been brought to the point to which they had now arrived.

Mr. Peter Graham said, as knowing the views of a large number of exhibitors, British and foreign, he begged to state that their opinion was that the building was extremely well adapted to its purpose.

The Chairman then proposed a vote of thanks to Mr. Hawes, for the paper he had been kind enough to read.

The vote of thanks having been passed,

Mr. Hawes expressed his gratification at the manner in which his paper had been received. With regard to the discussion, he could not but say that he thought nothing more clearly evidenced good taste and sound judgment, than to consult in the highest possible degree the feelings of those present in making any critical remarks, and though, possibly, the present building might be open to criticism, still this might have been put forward in a manner not likely to be offensive to the noble lord in the chair, who had himself taken a most active part in this Exhibition.

The Chairman assured the meeting that he felt no soreness whatever at the remarks which had been made that evening.

The Secretary announced that this was the last Ordinary Meeting of the Session, and that the Annual General Meeting would be held (in accordance with the bye-laws), on Wednesday, the 25th June, at 4 o'clock p.m.

Home Correspondence.

"A NEW PROJECTILE FORCE."

Sir,—In No. 494 of your *Journal*, there is a long and elaborate paper, by Dr. Meschin, on the above subject. I am not aware whether it is generally known, but in the year 1856 I was engaged in actively experimenting upon the motive power of the explosion caused by a mixture of various gases, with the same objects in view as are mentioned by Dr. Meschin, except as to the gas-gun. I had no idea of applying my ideas in that direction at the time. I may mention that I tried various experiments upon different substances and gases, and in the course of my investigations, determined practically the exact motive power of the explosion of gun-cotton.—(See the *Chemist.*) After taking all the gases practically available, I devoted all my attention to the mixture of air and water gas, or, as I called it, "Hydro-carbonyle." Some of the results I arrived at will help me to a correct criticism of some of Dr. Meschin's suggestions, and I shall be glad to communicate further with any one upon the subject than is warrantable in your valuable space.

Water could not be economically or practically decomposed into its constituents by frictional electricity. This, no one knowing electricity experimentally, is, I think, prepared to deny; and the same may be said of both thermo-electricity and magneto-electricity. Of course I admit water may be decomposed, but not at a practical cost; so that voltaic electricity alone remains, and the author of the paper must, I feel sure, depend upon that source alone for effective results.

The author, after having described his plan of charging his weapon, proposes firing it by means of several electric sparks. Why sparks should be proposed I cannot conceive, when the voltaic battery that would have to be used for forming the charge would afford the most efficient means of igniting the mixed gases by a fine wire.

After long and continuous labour, I found that a narrow strip of platinum plate may be used for a very long time to fire the gases, being fixed to the metal at one end of its length, and insulated to a wire at the other—the wire being in connection with the battery. By merely touching the metal of the machine or gun, with the other pole wire, instant ignition is invariably the result.

The author seems to calculate upon the mechanical effect of the recoil in an ingenious contrivance for charging with shot, &c.; but he should remember that the recoil will not be the same in "accelerated velocity" firing as in ordinary.

I agree with the principle of long bore and accelerated velocity in theory, but in practice I think guns should be as light as possible, to save carriage, and the increased length would add to the weight; and I think that it would be found necessary to have the same strength along the whole length of the bore that was filled by the gases in the charge, instead of the greatest strength being at the breech and the rest comparatively lighter.

The author states, correctly, that gunpowder gives at first an increasing force, and afterwards a diminishing force. This is perfectly true; but does the latter operate before the ball leaves the gun, or afterwards?

I think it a pity, too, that upon a subject of such importance the author should be content to say, "if the *Encyclopædia Metropolitana* be right." Surely it would be more conclusive if he had accurately ascertained if the book were right or not. Altogether the scheme is a web of suppositions, many of the suggestions being very excellent, but still not based, as far as I can see, upon any experimental discoveries or foundations.

The author states that a ton of zinc will evolve 1,966 cubic feet of the gases, under a pressure of 10 atmospheres. I cannot agree with this calculation at all. I make the quantity of mixed gases evolved by zinc equivalent for equivalent—equal to (in round numbers) 630 lbs. of water —10 cubic feet. Now, as hydrogen is about 12,000 times lighter than water, and oxygen 750 times, I find that a ton of zinc, or 2,240 lbs., will evolve nearly 2,000 cubic feet of mixed gases, at a pressure of 60 lbs.; or, as he states, 1,966 is somewhere near the quantity, but I must protest against such reasonings when the gases are to be evolved by the battery. This calculation holds good as to hydrogen, when zinc is dissolved in diluted acid; but certainly not when the two gases are collected at the electrodes of the battery, as proposed. There is a great quantity and density of voltaic electricity required to decompose even highly acidulated (and, therefore, more easily conducting) water; and many cells are required to enable the electricity to pass through the liquid at all, and in each cell hydrogen is evolved and zinc consumed theoretically in the same quantity and relative proportion as in the electrode vessel. All these cells would furnish hydrogen, but not oxygen. Certainly a contrivance could be arranged to collect the whole of this hydrogen, and to supply oxygen, chemically, to meet its requirements for combination; but I think there is no one prepared to say he is confident in the practical success of such a scheme at present, whatever voltaic electricity may do hereafter. Again, has the author considered the carriage in warlike times of a liquid like sulphuric acid? This, I know, is not an insurmountable objection, but it is still an evil that there is not now.

The author states that the force impressed upon the projectile might be increased *ad libitum*, and that when the charge of gunpowder is largely augmented, part is blown away unaltered. I can conceive a plan of igniting any sized charge of gunpowder without wasting a grain by igniting the portion nearest the shot by voltaic electricity from a very small series of cells. And if the charge of gases were very largely increased, the length of the gun would have to be increased, or it must be made stronger, which would be a great evil.

Certainly I cannot understand why there should be no report when firing mixed gases; has Dr. Meschin ever fired a soap bubble of the gases and found no report? True, there would be a vacuum almost instantly produced after the explosion, and I have found on a very large scale, with a cylinder of 7 inches diameter and 2 feet long, that when the piston is heavily laden, the vacuum succeeds the explosion so rapidly that no outward force is produced at all, but always a report. Has Dr. Meschin a Cavendish glass or an eudiometer, or has he ever seen one experimented with? If so, he will remember observing on the small scale what I observed on the large. I am aware that this would be partly obviated by the shot being already in motion, and near the muzzle at the time of explosion, but has the author allowed for the cooling effect of so large a surface of cold metal as the bore of a cannon upon such a minute quantity of vapour of water as is expressed by his term of dew?

I hardly think he is quite plain upon another point. If the gases are to be used at a very high pressure, what will prevent the ball leaving its place during the entry of the charge of explosive mixture? So that

1st. It is doubtful whether the projectile force would be much cheaper than gunpowder; for the author sets out upon a calculation of a wrong basis, and afterwards, in summing up, omits the very item of cost of zinc, upon which his calculation of cost is based.

2nd. The carriage of vitriol and other requisite fluids would be equally, or more, liable to damage than gunpowder, and more dangerous in carriage.

3rd. There would be difficulties to be met in increasing the charge greatly; and the author has not, apparently, taken all sides of this question under consideration.

4th. To be answered below.

The other items have some erroneous ideas conveyed in them, but I will leave them at present. The author asserts that a heavy fly-wheel would prevent the loss of *vis viva* which might attend the suddenness of the application of the force produced by the explosion of the gases. This I deny. The explosion produces an effect instantaneously, similar to a blow from a hammer, but not of sufficient continuity to assist the fly-wheel materially, as before the mass could have acquired any of the force, it would be checked by the perfect vacuum.

The cost would be too great; for experiments have been made largely to enable the decomposition of acidulated water by zinc, to furnish hydrogen under pressure sufficient to obtain motive power, but always without success, the cost of materials being greater than the cost of steam. For the power obtained by voltaic electricity, the cost is increased, as only a small quantity of gases are evolved at the electrodes, for a large number of cells in each of which a similar and equivalent quantity of zinc is consumed.

To avoid the suddenness of this explosion and the rapidity of its succeeding vacuum, I conceived the idea of mixing a neutral gas with the active mixture, which, becoming heated, I thought would, being a bad conductor, prevent the instantaneous succession of the vacuum, and I therefore tried air in place of oxygen, and carbonic oxide, mixed with the hydrogen, or water gas, so that carbonic acid and nitrogen remained as gases after the explosion took place, but I found that a certain charge produced no effect whatever on the piston if loaded, and if not, the same charge would carry the whole piston-rod, &c., away, and this with very little difference in the weight of the piston. I got my engine to work certainly, but in a little while the cylinder became so hot that less charge was required, and the vacuum not so perfect, and, at last, the whole machine burst. My friend, Mr. W. H. Perkin, suggested a modification of my engine, viz., the passing a small quantity of steam over a cylinder of coke kept red hot, and then driving the engine with these gases, and burning them to heat the cylinder and boiler after passing through the cylinder. But we could not at the time devise any method of keeping the coke sufficiently hot in a vessel capable of withstanding the pressure requisite to constitute an available force, and since then other matters have drawn my attention into other channels.

Trusting you will excuse so long a communication, which is, after all, only a hurried and cursory glance at some of the author's ideas,

I am, &c.,

JOHN G. BLOCKEY.

Hyde-park, Leeds.

P.S.—It might assist the author in his calculations to be reminded that if the hydrogen from every cell of the battery were collected, and the resulting sulphate of zinc treated by Deville's method for oxygen, that still larger quantities might be obtained of the mixed gases. The sulphurous acid too is valuable in stationary situations; indeed, fresh acid could be got from it to re-charge the batteries.

RECREATION IN MECHANICS' INSTITUTIONS.

SIR,—I have read with much interest the thoroughly practical remarks of Mr. Blake in last week's *Journal*, and I beg to give a few words of confirmation derived from some experience among the Institutions of the Midland Counties.

During last winter a most successful series of popular concerts and readings was given on Saturday evenings, in the Wolverhampton Corn Exchange. The payments were 4d. and 2d., and the hall was invariably crowded with attentive and appreciative artisans. Their amateur entertainments were much valued by the public generally, and, in a financial point of view, resulted in a gain of nearly £200, which the Committee purpose to apply to the establishment of some Institution for the people.

In the neighbouring town of Bilston, a place regarded by many as the blackest of all black spots, both in its physical and moral aspects, a few zealous men set themselves last winter to provide a means of rational recreation for the masses of the population, who, it was felt, went to gin-palaces and singing saloons, chiefly because no other means existed for obtaining that relaxation which those who labour in the trying atmosphere of furnaces, forges, and coal-mines require. These entertainments were of a more varied character than those at Wolverhampton. Instrumental music from several bands of the town; songs by amateurs; concerted pieces; readings from standard authors; recitations from Shakspeare, &c., and a fair sprinkling of comic matter, made up weekly a programme sufficiently attractive to draw a large audience for eighteen successive Thursday nights. Classes were established for other evenings, and at each social gathering some allusion was made to them, consequently a very large attendance was kept up in the neighbourhood through the winter and spring months. The whole plan has been most successful and encouraging.

But here my list must close. I can single out no more continued attempts at providing rational amusement for the people at large, from among the 100 Institutions lying in and near this manufacturing district. There is a sound, however, of coming attempts, when the long nights reach us again, and I believe many such trials will be made, which will not all be successful, for the simple reason that too many, who contemplate doing something in this matter of popular recreation, will never get beyond the laudable desire to aid in the work—they will never put the "shoulder to the wheel" by making those sacrifices of time and labour without which no lasting results are likely to be obtained. I trust I may be able to write you another year of more success than I dare anticipate, but

> "Forward, though I canna see,
> I guess an' fear."

I am, &c.,

JOHN JONES.

South Staffordshire Educational Association,
Dudley, May 27th, 1862.

MEETINGS FOR THE ENSUING WEEK.

MON......Entomological, 7.

British Architects, 8.

Geologists' Assoc., 7. 1. Mr. Marcus W. T. Scott, "Mine Surveying and Planning, and the Instruments Employed therein." 2. Mr. R. J. S. Gappy, "On the Older Parian Formation at Pointe-a-Pine, Trinidad.

Royal Inst., 2. General Monthly Meeting.

TUES. ...Photographic, 8.

Ethnological, 8. 1. Mr. Spencer St. John, "On the Wild Tribes of Borneo." 2. Mr. Wm. Spottiswoode, "On the Wild Tribes of Kurdistan." 3. Dr. Edward Pick, "On the Law of Growth, as discovered by Dr. Liharzik." 4. "A Short Vocabulary Collected in Australia by Mr. Walcott," communicated by the Duke of Newcastle.

Architectural Museum, South Kensington, 8. Mr. G. G. Scott, R.A., "On the Formation of a National Museum of Architecture as viewed especially in its connection with the Mediæval Styles."

Royal Inst., 4. Rev. G. Butler, "On the Art of the Last Century."

WED. ...Geological, 8.

THURS...Antiquaries, 8½.

Linnæan, 8. 1. Dr. Hooker, "On the Vegetation of the Cameroon Mountains." 2. Dr. Hicks, "On the Confervoid Filaments and Gonidia of Mosses." 3. Dr. Anderson, "On the Acanthaceæ of Africa, and the adjacent islands."

Chemical, 8.

Royal Society Club, 6.

Royal Inst., 3. Dr. Lyon Playfair, "On the Progress of Chemical Arts."

FRI.......Royal Inst., 8. Professor Tyndall, "On Force."

Archæological Inst., 4.

R. Horticultural Soc., 2.

SAT.......Royal Inst., 3. Prof. Anderson, "On Agricultural Chemistry."

Actuaries, 3. Annual Meeting.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, May* 16*th*, 1862.]

Dated 5*th May*, 1862.

1340. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in steam generators. (A com.)

1342. B. Cooke, Frathy-house, Anthony, Devonport—An improved construction of implement for cutting turf.

Dated 6*th May*, 1862.

1344. R. Mills, Bury—Imp. in washing, wringing, drying, and mangling machines.

1348. J. Clarke and J. Richmond, Chilvers Coton, Warwickshire—Imp. in looms for weaving.

1350. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in the manufacture and production of minium or red lead. (A com.)

1352. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in the manufacture of soda and potash, and of their carbonates. (A com.)

1354. W. Clark, 53, Chancery-lane—Imp. in cylinder printing apparatus. (A com.)

Dated 7*th May*, 1862.

1358. E. Bourdon, Paris—Imp. in the construction of blowing fans, which improvements are also applicable to centrifugal pumps for raising water and other liquids or gases, or for exhausting the same.

1366. R. A. Brooman, 166, Fleet-street—An improved box and apparatus for containing and igniting matches. (A com.)

1368. J. Combe, Leeds—An improved machine for spreading and drawing into slivers flax, hemp, jute, and other fibrous substances.

1372. D. Marchal and A. C. De Wiart, Brussels—An mproved method of preventing the destructive effects of vibration or jar on the permanent way of railways, and on the wheels, axletrees, and other parts of carriages, and the working and other parts of machinery liable to shocks.

Dated 8*th May*, 1862.

1374. J. Hay, Troon, Ayr, N.B.—Improved arrangements to facilitate the cleaning and repairing of ships' bottoms.

1378. W. Southwood, Kensington—Imp. in machinery for pulverising ores and extracting metals therefrom, part of which is applicable to breaking stones.

1380. P. Tate, Park-terrace, South-street, Kennington—Imp. in smelting furnaces. (A com.)

1384. A. Kinder, 30, Cannon-street—Imp. in the manufacture of sheet metal.

1386. N. Thompson, Birmingham—Imp. in barometers. (A com.)

[*From Gazette, May* 23*rd*, 1862.]

Dated 8*th February*, 1862.

334. J. A. Knight, 4 Symond's-inn, Chancery-lane—Imp. in washing machines. (A com.)

Dated 21*st February*, 1862.

465. R. Pickin and W. E. Pickin, Birmingham—Imp. in the manufacture of carriage bodies.

Dated 27*th March*, 1862.

843. J. Haworth, 22, Southampton-street, Bloomsbury—An improved method of conveying telegraphic messages and signals by means of electricity without the intervention of any continuous artificial conductor.

849. W. F. Henson, 15, New Cavendish-street, Portland-place, and H. H. Henson, 13, Parliament-street—Imp. in wicks for candles and lamps.

Dated 1*st April*, 1862.

921. H. Lorenz and T. Vette, Berlin—Imp. in filters.

Dated 2*nd April*, 1862.

934. W. Clark, 53, Chancery-lane—An improved apparatus for manifold writing. (A com.)

Dated 3*rd April*, 1862.

947. J. Lee, Traction Engine Works, Lincoln—Imp. in traction engines and boilers for traction, locomotive, and other purposes.

Dated 7*th April*, 1862.

985. G. Haseltine, 100, Fleet-street—Imp. in lamps especially designed for burning hydro-carbon oils. (A com.)

989. J. Carrington, Queen's-gate Mews, Kensington—Imp. in the form of bricks, and in the arrangement thereof for paving stables and stable yards.

Dated 8*th April*, 1862.

993. H. Levinstein, 2, Pinners-court, Old Broad-street—Imp. in lustreing silk, and in machinery or apparatus employed therein.

Dated 11*th April*, 1862.

1041. E. H. Carbutt, Bradford—Imp. in pistons.

Dated 21*st April*, 1862.

1152. J. Combe, Belfast—Imp. in machinery for hackling flax and other fibrous substances.

Dated 22*nd April*, 1862.

1169. C. E. Elliott, 5, Aldermanbury Postern—Imp. in the preparation of dried yeast. (A com.)

Dated 25*th April*, 1862.

1209. J. F. Brunet, 21, King William-street, Strand—Imp. in the manufacture of fringes, and in apparatus connected therewith. (A com.)

Dated 29*th April*, 1862.

1252. W. Clark, 53, Chancery-lane—An improved method of preserving animal and vegetable substances. (A com.)

1263. M. Henry, 84, Fleet-street—Imp. in apparatus for aerating liquids, and in fastenings for the said apparatus and for other articles. (A com.)

Dated 30*th April*, 1862.

1268. G. Davies, 1, Serle-street, Lincoln's-inn—An improved electric apparatus applicable to various useful purposes. (A com.)

Dated 5*th May*, 1862.

1328. H. Allman, Bedford-row—Certain imp. in the construction of locks.

1336. R. Bushby, Little Hampton, Sussex—An improved method o lifting or lightening ships for entering shallow harbours, or docking and other purposes.

1338. P. L. A. T. Sourbé, Condom, France—An improved method of maturing spirits and wines.

Dated 7*th May*, 1862.

1360. Lieut. P. H. Colomb, R.N., H.M. Dockyard, Devonport—Imp. in arrangements and apparatus for signalling.

1362. T. H. Hopwood, Hulme, Manchester—Certain imp. in the means or apparatus to be employed for the purpose of raising sunken vessels or other submerged bodies, and also in the application of a self-acting balance and regulator to the pontoons used therein.

1364. N. Wood, Hetton-hall, Durham, and J. Stockley, Newcastle-on-Tyne—Imp. in apparatus for grinding, smoothing, and polishing plate glass.

1370. J. Haley, Rochester-villa, Battersea—Imp in armour plates for ships, boats, and batteries.

Dated 8*th May*, 1862.

1382. G. C. Grimes, 8, Wandle-terrace, South-street, Wandsworth—Imp. in the manufacture of cigar lights, splints, matches, and tapers or vestas, and in machinery or apparatus employed therein.

Dated 9*th May*, 1862.

1390. T. K. Mace, Birmingham—Imp. in guards or protectors for hats and other coverings for the head.

1394. T. Fawcett, jun., Lisburn, Ireland—Imp. in plaited fabrics for shirt fronts and other uses, and in the mode of and mechanism for manufacturing the same.

1396. T. Welton, 13, Grafton-street, Fitzroy-square—Imp. in the preparation of beverages in connection with brewing.

1398. Capt. F. J. Bolton, Bolton-row, May Fair—Imp. in telegraphing for naval and military and other purposes, and in the apparatus connected therewith.

Dated 10*th May*, 1862.

1402. J. F. Milward, Redditch—Imp. in breech-loading fire-arms. (A com.)

1404. R. Moore, Cannon-street-west—Improved apparatus for indicating the presence, position, or accumulation of liquids, gases, or vapours, and apparatus for preventing danger or damage consequent thereon.

1406. J. T. Cooke, Leicester—Imp. in battens used in weaving.

1408. H. D. Taylor and E. Robinson, Huddersfield—Imp. in piece-dyed woollen fabrics, or fabrics composed of wool in combination with other fibrous substances.

1410. W. H. Ronald, Montrose—Imp. in apparatus for signalling and indicating the position of shots in rifle practice.

1414. H. W. Sambridge, Birmingham—Imp. in sliding chandeliers, gaseliers, and other pendant lamps.

Dated 12*th May*, 1862.

1416. J. Milnes, Gloucester—Imp. in portable apparatus for exercising the human body.

1418. W. Clark, 53, Chancery-lane—Imp. in smoke consuming fire-grates. (A com.)

1420. C. J. Harris, 20, King William-street, Charing-cross—Imp. in the manufacture of detector, season, or non-transferable tickets.

1422. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in casting metals, and in the moulds and cores employed therein. (A com.)

1424. H. Cartwright, The Dean Broseley, Shropshire—Imp. in propelling and steering screw steam vessels.

1428. J. L. Wilson, St. John-street, Smithfield—Imp. in calendering woven fabrics, and in the apparatus employed for this purpose.

1430. E. F. Lansky, Nottingham-street, Sheffield—An improved mode of, and apparatus for, working railway carriage brakes.

Dated 13*th May*, 1862.

1432. S. B. Ardrey, Birmingham, and S. Beckett, Oldham—Imp. in machinery or apparatus for manufacturing spindles, part of which apparatus is also applicable to grinding and polishing other articles.

INVENTION WITH COMPLETE SPECIFICATION FILED.

1490. N. Ames, Saugus, Massachusetts—A new and useful self-feeding card printing press.—16th May, 1862.

1505. E. J. Bridell, Middle Temple—Imp. in the manufacture of substances artificially coloured, veined, or mottled, like marbles or other substances.—17th May, 1862.

PATENTS SEALED.

[*From Gazette, May* 23*rd*, 1862.]

May 23*rd*.

2981. F. F. Dumarchey.
2991. W. Clark.
2995. W. Rowan.
3002. P. Spence.
3008. L. H. C. J. Carle.
3026. R. A. Rust.
3209. W. L. Allchin and W. Allchin.
3257. W. E. Newton.
3269. W. H. Bailey.
475. G. T. Bousfield.
667. W. H. Latham, and F. C. W. Latham.
829. J. T. Loft.
844. W. Greenaway.

[*From Gazette, May* 27*th*, 1862.]

May 27*th*.

2122. H. Nelson, J. Carr, and G. Harrison.
3019. J. Cooper and C. Garrood.
3022. J. Wakenell.
3025. T. W. G. Treeby.
3028. J. H. Glew.
3030. J. Leach.
3032. J. L. Field.
3035. W. E. Gedge.
3042. R. Kennedy and J. Armstrong.
3055. M. Henry.
3057. A. Woodward, R. Woodward, and W. Woodward.
3058. J. Bailey and W. H. Bailey.
3108. W. H. Tooth and W. Yates.
3120. J. D. Jobin.
3150. E. Cajot.
3162. R. Shaw.
3214. J. H. Johnson.
38. J. Coryton.
510. J. Whitworth.
700. J. Kent.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, May* 27*th*, 1862.]

May 19*th*.

1240. J. Valda.
1268. C. P. Moody.
1270. F. J. Bramwell.
1350. G. H. Cottam and H. R. Cottam.

May 22*nd*.

1272. N. S. Dodge.
1279. G. D. Jones.
1289. R. A. Glass.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, May* 27*th*, 1862.]

May 20*th*.

1139. I. J. Silbermann, jun.

May 21*st*.

1167. J. A. Longridge.
1170. J. Park.

May 22*nd*.

1195. W. S. Young.
1199. C. W. Harrison.

LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Name.	Address.
4481	May 17.	Rotary Jag for cleaning the barrels of Rifles.	James Aston	School of Musketry, Hythe.
4482	„ 26.	Plough	John Hodgson	29, Newmarket street, Lincolnshire.